

**FRIEDMAN & BRUYA, INC.**

**ENVIRONMENTAL CHEMISTS**

Date of Report: December 12, 1995  
Date Received: November 27, 1995  
Project: Carse Acid Tank, PO #M51440  
Date Samples Extracted: November 27-29, 1995  
Date Extracts Analyzed: November 27-29, 1995

**RESULTS FROM THE ANALYSIS OF THE PROCESS WATER SAMPLE  
FOR TOTAL METALS BY  
INDUCTIVELY COUPLED PLASMA (ICP)  
(METHOD 6010)**

**Samples Processed Using Method 3005**  
Results Reported as mg/L (ppm)

<u>Sample ID</u>	<u>M51440</u>	<u>Method Blank</u>
Analyte:		
Arsenic	5.8	<0.4
Barium	<0.05	<0.05
Chromium	58	<0.05
Lead	<0.2	<0.2
Silver	<0.05	<0.05
Copper	2.7	<0.05
Nickel	27	<0.05
Zinc	0.07	<0.05

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## ENVIRONMENTAL CHEMISTS

Date of Report: December 12, 1995  
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 Project: Carse Acid Tank, PO #M51440

### QUALITY ASSURANCE RESULTS FOR TOTAL METALS BY INDUCTIVELY COUPLED PLASMA (ICP) (METHOD 6010) Samples Processed Using Method 3005

Laboratory Code: KJ64243DU

Analyte:	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Arsenic	mg/L (ppm)	0.8	0.7	13	0-20
Cadmium	mg/L (ppm)	<0.05	<0.05	nm	0-20
Chromium	mg/L (ppm)	0.52	0.53	2	0-20
Lead	mg/L (ppm)	<0.2	<0.2	nm	0-20
Silver	mg/L (ppm)	<0.05	<0.05	nm	0-20
Copper	mg/L (ppm)	1.8	2.2	20	0-20
Nickel	mg/L (ppm)	5.1	5.3	4	0-20
Zinc	mg/L (ppm)	<0.05	<0.05	nm	0-20

Laboratory Code: KJ64243MS/KJ64243MD

Analyte:	Reporting Units	Spike Level	Sample Result	% Recovery MS	% Recovery MSD	Acceptance Criteria	Relative Percent Difference
Arsenic	mg/L (ppm)	10	0.8	96	97	80-120	1
Cadmium	mg/L (ppm)	5	<0.05	94	100	80-120	6
Chromium	mg/L (ppm)	5	0.52	90	88	80-120	2
Lead	mg/L (ppm)	10	<0.2	102	102	80-120	0
Silver	mg/L (ppm)	2	<0.05	74	74	50-150	0
Copper	mg/L (ppm)	5	1.8	119	112	80-120	6
Nickel	mg/L (ppm)	10	5.1	95	87	80-120	9
Zinc	mg/L (ppm)	5	<0.05	98	106	80-120	8

Laboratory Code: Spike Blank

Analyte:	Reporting Units	Spike Level	% Recovery MS	Acceptance Criteria
Arsenic	mg/L (ppm)	10	109	80-120
Cadmium	mg/L (ppm)	5	97	80-120
Chromium	mg/L (ppm)	5	110	80-120
Lead	mg/L (ppm)	10	118	80-120
Silver	mg/L (ppm)	2	93	80-120
Copper	mg/L (ppm)	5	111	80-120
Nickel	mg/L (ppm)	10	112	80-120
Zinc	mg/L (ppm)	5	98	80-120

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

**FRIEDMAN & BRUYA, INC.**

**ENVIRONMENTAL CHEMISTS**

Date of Report: December 12, 1995  
Date Received: November 27, 1995  
Project: Carse Acid Tank, PO #M51440  
Date Extracts Analyzed: November 28, 1995

**RESULTS FROM THE ANALYSIS OF THE PROCESS WATER SAMPLE  
FOR SPECIFIC GRAVITY  
@ 15.56 °C**

<u>Sample ID</u>	<u>Specific Gravity</u>
M51440	1.07

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**ENVIRONMENTAL CHEMISTS**

Date of Report: December 12, 1995  
Date Received: November 27, 1995  
Project: Carse Acid Tank, PO #M51440  
Date Extracts Analyzed: November 28, 1995

**RESULTS FROM THE ANALYSIS OF THE PROCESS WATER SAMPLE  
FOR % ACID BY WEIGHT**

Sample ID

% Acid By Weight

M51440

5.5

**FRIEDMAN & BRUYA, INC.**

**ENVIRONMENTAL CHEMISTS**

Date of Report: December 12, 1995  
Date Received: November 27, 1995  
Project: Carse Acid Tank, PO #M51440  
Date Samples Extracted: December 7, 1995  
Date Extracts Analyzed: December 7, 1995

**RESULTS FROM THE ANALYSIS OF THE PROCESS WATER SAMPLE  
FOR FINGERPRINT CHARACTERIZATION  
BY INDUCTIVELY COUPLED PLASMA (ICP)  
EMISSION SPECTROSCOPY  
Samples Processed Using Method 3005**

**Sample ID**

**M51440**

**ICP Characterization**

The ICP emission spectroscopy trace showed the presence of the following metal at the approximate level indicated.

**Iron (6.5 ppm)**

19.3  
KNS AL  
11.27.95  
10:27

Send Report To: Alaska Copper Works Contact GERARD THOMPSON  
Company Alaska Copper Works  
Address 623 Henderson St  
City, State, Zip Seattle WA 98134  
Phone # (206) 623-5800 X325 Date 11-27-55

[illegible]

**FORMS/COC**

09/19/94

AKC-0012473

**FRIEDMAN & BRUYA, INC.**

**ENVIRONMENTAL CHEMISTS**

Andrew John Friedman  
James E. Bruya, Ph.D.  
(206) 285-8282

3012 16th Avenue West  
Seattle, WA 98119-2029  
FAX: (206) 283-5044

December 12, 1995

Gerry Thompson, Project Leader  
Alaskan Copper Works  
628 South Hanford  
Seattle, WA 98134

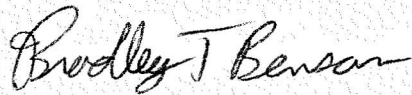
Dear Mr. Thompson:

Enclosed are the results from the testing of material submitted on November 27, 1995 from your Carse Acid Tank, PO #M51440 project.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Kurt Johnson  
Chemist

keh  
Enclosures  
FAX: 0382-7335  
ACU1212R.DOC

**FRIEDMAN & BRUYA, INC.**

**ENVIRONMENTAL CHEMISTS**

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December 12, 1995

**INVOICE # 95ACU1212-1  
DUPLICATE COPY**

Accounts Payable  
Alaskan Copper Works  
628 South Hanford  
Seattle, WA 98134

RE: Project Carse Acid Tank, PO #M51440: Results of testing requested by Gerry Thompson, Project Leader for material submitted on November 27, 1995.

1 process water sample analyzed for Total Metals by Method 6010 @ \$105 per sample	\$ 105.00
1 process water sample analyzed for Specific Gravity @ \$25 per sample	25.00
1 process water sample analyzed for % Acid By Weight @ \$25 per sample	25.00
1 process water sample scanned for iron by ICP Emission Spectroscopy @ \$200 per sample (no charge)	<u>0.00</u>
Amount Due .....	\$ 155.00